DEVELOPMENT OF DIGITAL TWIN

CONGRATULATIONS!!!!!!!

Today is the era of technological advancements. Digital twin technology is a rapidly growing concept related to industry4.0, gaining traction in various industries such as manufacturing, healthcare, real estate, and aerospace. Essentially it's an emerging technology that will shape the future of organizations. A digital twin is a virtual replica of an object or system that spans its lifecycle, is updated from real-time data, and uses machine learning and reasoning to help decision making. Indeed, the real power of a digital twin is that it can provide a near-real-time comprehensive linkage between the physical and digital worlds.

SARDAR PATEL COLLEGE OF ENGINEERING is happy to announce the development of their first digital twin of lathe machine by final year students as a part of their project. The digital twin was developed by following Btech (Mechanical) students under the expert guidance of project guide Dr. Rajesh Buktar. The title of their project was ***"DEVELOPMENT OF DIGITAL TWIN OF LATHE MACHINE USING MICROSOFT AZURE PLATFORM FOR REAL-TIME CONDITION MONITORING".*** *Principal, Dr.M.M.Murudi & Head of the department, Mechanical engg. Dr.R.S.Maurya congratulate these students & their project guide for developing such a technologically advanced solution.*

Mr. Aniket Deshmukh

Mr. Mohd. Irfan Mohd Ismail

Miss. Alisha Dhawde

HIGHLIGHTS OF THE WORK

This work centers on the development of a digital twin for a Lathe Machine utilizing the Microsoft Azure Platform. By equipping the Lathe machine with various sensors, real-time data was collected using Azure IoT Hub. The collected data was further analyzed utilizing various machine learning models hosted on the Azure cloud platform to predict the tool condition. The user can visualize the real-time condition of the tool using Azure Digital Twin. In this regard a cloud based Digital Twin framework of Lathe Machine was developed which highlights the various components utilized.

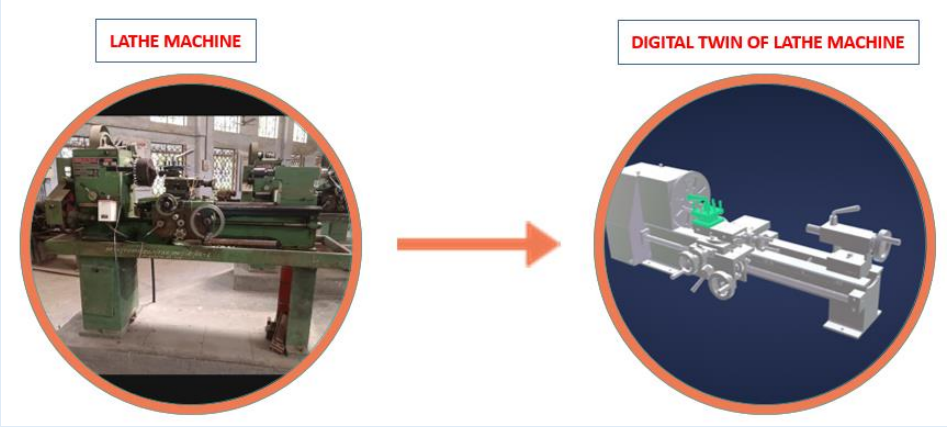

Figure: DIGITAL TWIN OF LATHE MACHINE

BENEFIT TO THE INDUSTRIES

The digital twin may enable companies to solve physical issues faster by detecting them sooner, predict outcomes to a much higher degree of accuracy, design and build better products, and, ultimately, better serve their customers. With this type of smart framework design, companies may realize value and benefits iteratively and faster than ever before.

This work can also be helpful to Industries for monitoring various assets and equipment's to avoid untimed breakdown. Mechanical Engineering Department, (SPCE) has taken initiative by introducing various industry4.0 courses like

- *Augmented Reality/ Mixed Reality*
- *Virtual Reality*
- *Internet of Things (IOT)*
- *Big Data Analytics*
- *Machine / Deep Learning*
- *Digital Twin*
- *Smart City for sustainable development*
- *Generative Design*
- *COBOTS*

Students are enrolling for these courses and are being equipped with industry4.0 skillsets. A future ready talent pool & workforce is being developed at SPCE to provide solutions to the industries

Dr.M.M. Murudi, Principal

Dr.R.S.Maurya, HOD (Mech)

Dr. Rajesh Buktar, Project Guide